

AMENDMENTS TO THE CLAIMS

Pursuant to 37 CFR §121(c), the claim listing, including the text of the claims, will serve to replace all prior versions of the claims in the application.

Please amend claims 21-24 and 26, add claims 29 and 30, and cancel claims 25 and 28 without disclaiming the subject matter thereof, to read as follows:

Claims 1-20 (Canceled)

1 21. (Currently Amended) A method for producing a high-purity potassium
2 chromate crystal, the method comprising the steps of:

3 reacting chromite ore in a first aqueous solution of potassium hydroxide with an
4 oxidant to obtain decomposing chromite ore and obtaining a mixture of potassium
5 hydroxide, potassium chromate, and ferrous residue ~~after reacting chromite ore with an~~
6 ~~oxidant in molten salt or in aqueous solution of potassium hydroxide~~, wherein weight of
7 the potassium hydroxide in the mixture is two to eight times as weight of the chromite
8 ore [[;]] an amount of the oxidant is equal to or above a stoichiometric amount of the
9 oxidant required for decomposing chromite ore [[;]] , water in the reaction is in a range
10 from greater than {{0}} ± to 50% by weight of total amount of reactants [[;]] , reaction
11 temperature is in a range of from 200 °C to {{450}} 350 °C [[;]] and reaction time is in
12 a range of from 1 to 20 hours and chromium content of ferrous residue is below 0.5%
13 by weight.

14 leaching the mixture with water or [[an]] a second aqueous solution of potassium
15 hydroxide with a concentration ranged from greater than [[0]] ~~to~~ 30% by weight, and
16 obtaining a leached slurry having an potassium hydroxide content of 30% to 70% by
17 weight [[.]]~~; and}}~~ ~~;~~

18 ~~separating the leaching leached slurry and obtaining, respectively, a primary~~
19 ~~potassium chromate product, ferrous residue, and a third aqueous solution of potassium~~
20 ~~hydroxide liquor, wherein recovery rate of chromium approaches 100%.~~

1 22. (Currently Amended) The method for producing chromate as claimed in
2 Claim 21, further comprising ~~the steps of~~ purifying the primary potassium chromate
3 ~~products~~ product to manufacture [[pure]] the high-high-purity potassium chromate
4 ~~crystal, which~~ wherein the purifying of the primary potassium chromate product further
5 ~~comprises~~ the steps of:

6 ~~the steps of~~ dissolving the primary potassium ~~products~~ product in water
7 ~~or/and~~ an aqueous solution ~~—~~and obtaining a primary potassium chromate aqueous
8 solution [[.]]~~;~~

9 adjusting pH value of the primary potassium chromate aqueous solution to be in
10 a range ~~of~~ from 3 to 9 with an acidifying agent, filtering out ~~[[the]]~~ precipitates
11 ~~generated during the step of adjusting the pH value of the chromate aqueous solution,~~
12 and obtaining a pure potassium chromate aqueous solution; and

13 separating potassium chromate from the pure potassium chromate aqueous
14 solution using an evaporation crystallization method by heating the pure potassium
15 chromate aqueous solution to evaporate [[the]] water from the pure potassium chromate
16 aqueous solution to obtain potassium chromate crystal precipitates and a mother liquor,
17 filtering the potassium chromate crystal precipitates from the mother liquor and drying
18 the potassium chromate crystal precipitates to obtain and obtaining pure the high-high-
19 purity potassium chromate crystal after crystallizing, filtering, and drying mother liquor.

1 23. (Currently Amended) The method for producing chromate as claimed in
2 Claim 21, wherein [[the]] said oxidant is air [[,]] or oxygen, ~~potassium nitrite,~~
3 ~~potassium peroxide, or a mixture thereof.~~

1 24. (Currently Amended) The method for producing chromate as claimed in
2 Claim 21, wherein the potassium hydroxide in the first aqueous solution of potassium
3 hydroxide that reacts with the chromate-chromite ore comprises potassium hydroxide
4 recycled from the third aqueous solution of potassium hydroxide ~~liquor~~ obtained
5 ~~[[from]]~~ by the step of separating the ~~leaching~~ leached slurry.

1 Claim 25. (Cancelled)

1 26. (Currently Amended) The method for producing chromate as claimed in
2 Claim 22, wherein the aqueous solution used to dissolve the primary potassium
3 chromate product is a potassium hydroxide aqueous solution with a
4 concentration ranged from 0 to 20% by weight the mother liquor obtained in the step of
5 heating the pure potassium chromate aqueous solution.

1 27. (Previously Presented~~Currently Amended~~) The method for producing
2 chromate as claimed in Claim 22, wherein the acidifying agent is selected from among
3 at least one of an inorganic acid, an acidic gas, chromium anhydride, potassium
4 dichromate, potassium bicarbonate, [[or]] and potassium bisulfate;
5 the inorganic acid is selected from among at least one of sulfuric acid,
6 hydrochloric acid, [[or]] and nitric acid; and
7 the acidic gas is selected from among at least one of carbon dioxide [[or]] and
8 sulfur dioxide.

1 Claim 28. (Cancelled)

1 29. (New) The method for producing chromate as claimed in Claim 22, further
2 comprising adjusting the pH value of the primary potassium chromate aqueous solution
3 with the acidifying agent to be in a range of from 5 to 9.

1 30. (New) The method for producing chromate as claimed in Claim 29, further
2 comprising adjusting the pH value of the primary potassium chromate aqueous solution
3 with the acidifying agent to be in a range of from 6 to 8.

1 31. (New) The method for producing chromate as claimed in Claim 21, further
2 comprised of recycling potassium hydroxide from the third aqueous solution of
3 potassium hydroxide obtained by separating the leached slurry, and providing the
4 recycled potassium hydroxide for the first aqueous solution of potassium hydroxide that
5 reacts with the chromite ore.

1 32. (New) A method for producing a high-purity potassium chromate crystal, the
2 method comprising the steps of:
3 reacting chromite ore in a first aqueous solution of potassium hydroxide with an
4 oxidant to obtain a mixture of potassium hydroxide, potassium chromate, and ferrous
5 residue, wherein weight of the potassium hydroxide in the mixture is two to eight times
6 as weight of the chromite ore, an amount of the oxidant is equal to or above a
7 stoichiometric amount of the oxidant required for decomposing chromite ore, water in
8 the reaction is in a range from greater than 0 to 50% by weight of total amount of
9 reactants, reaction temperature is in a range from 200 °C to 350 °C, and reaction time is
10 in a range from 1 to 20 hours;

11 leaching the mixture with water or a second aqueous solution of potassium
12 hydroxide with a concentration ranged from greater than 0 to 30% by weight, and
13 obtaining a leached slurry having an potassium hydroxide content of 30% to 70% by
14 weight;

15 separating the leached slurry and obtaining, respectively, a primary potassium
16 chromate product, ferrous residue, and a third aqueous solution of potassium hydroxide;
17 and

18 purifying the primary potassium chromate product to manufacture the high-purity
19 potassium chromate crystal, wherein the purifying of the primary potassium chromate
20 product further comprises the steps of:

21 dissolving the primary potassium chromate product in water or an aqueous
22 solution and obtaining a primary potassium chromate aqueous solution;

23 adjusting pH value of the primary potassium chromate aqueous solution to
24 be in a range from 3 to 9 with an acidifying agent, filtering out precipitates
25 generated during the step of adjusting the pH value of the chromate aqueous
26 solution, and obtaining a pure potassium chromate aqueous solution; and

27 separating potassium chromate from the pure potassium chromate aqueous
28 solution using an evaporation crystallization method by heating the pure
29 potassium chromate aqueous solution to evaporate water from the pure potassium
30 chromate aqueous solution to obtain potassium chromate crystal precipitates and
31 a mother liquor, filtering the potassium chromate crystal precipitates from the

32 mother liquor and drying the potassium chromate crystal precipitates to obtain
33 the high-purity potassium chromate crystal.